On page 16 line 11, replace "as the temperature increases. The size" with "as the ambient temperature increases. But the blinking spot size".

On page 16 line 14, replace "crystal's temperature is not crossing a phase" with "crystal's temperature is not beyond the phase".

On page 16 line 16, after "the two types of blinking." insert "We have illustrated heating lights as the means of heating up the liquid crystal film. However, if the heating lights were replaced by other heating means, such as a conductive hot plate, or a convective oven, the infinitesimal temperature control method would still work, as long as these alternate heating means were operated at a repeatedly turning on and turning off mode. Therefore, this hot spot detection process will also work well with other heating means.".

In the CLAIM:

I withdrew claims 1, 2, 3 and 4. I added new claims 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15. There is no new information in the new claims. Basically, I have rewritten independent claims 1, 2, 3 and 4 into dependent claims 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and an independent claim 15. The added claims are easy for the examiner to follow; more specifically, I have carefully separated prior art from current invention. The added new claims are as follows:

~~5.~~ 1 In a method of detecting a hot spot on a die or a wafer, said method comprises:

applying a liquid crystal to form a liquid crystal film on the top surface of said die or said wafer, adjusting the thickness of said liquid crystal film with a thickness adjustment process;

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P1 placing said die or said wafer on the stage of a microscope that has a polarized illuminating light and an analyser, said analyser is placed on the viewing path of said microscope, said polarizer and said polarized illuminating light are cross polarized; said polarized illuminating light illuminates said die or said wafer that are placed on said stage;

P1 delivering a current to the site of said hot spot of said die or said wafer by a current injecting means;

P1 controlling the temperature of said liquid crystal film with a temperature control means;

P1 locating a change in optical property on said liquid crystal film by a means of viewing said liquid crystal film through said analyser, using a differentiation means to confirm said change is induced by a localized phase transition in said liquid crystal film, thus said hot spot is located at location where said localized phase transition takes place;

a25 contd

P1 wherein the improvement comprises:

an infinitesimal temperature control method for controlling the temperature of said liquid crystal film; said infinitesimal temperature control method comprises an operation on a heating system;

P1 said heating system comprises:

a power supply means; a heat generating means; and an adjustment means;

said power supply means delivers power to said heat generating means, said heat generating means generates heat for heating up said liquid crystal film, said adjustment means controls the heating output magnitude of said heat

generating means, said adjustment means also controls the turning on and turning off of said heat generating means, the action of said turning on and turning off of said heat generating means brings said temperature of said liquid crystal film to an infinitesimally close below the phase transition temperature of said liquid crystal for a limited length of time, whereby enabling said hot spot of an arbitrary small power level on said die or said wafer to produce said localized phase transition in said liquid crystal film, for said limited length of time; a reduction in said heating output magnitude prolongs said limited length of time, whereby increasing the chances of detecting said localized phase transition;

A25 P1 cont'd

said operation comprises:

step (a): adjusting said adjusting means to an output level such that the combined heating from said heat generating means and said current is sufficient to heat up said liquid crystal film that at said site to beyond said phase transition temperature;

P1 step (b): turning off said heating means to allow said liquid crystal film to be cooled below said phase transition temperature;

P1 step (c): turning on said heat generating means to heat up said liquid crystal, till said liquid crystal film at said site is heated to beyond said phase transition temperature;

P1 step (d): if said hot spot cannot be detected because said limited length of time is too short, then reducing said output level to a low output level such that the combined heating from said heat generating means and said current is still sufficient to heat up said liquid crystal film that at immediate

adjacent area of said site to beyond said phase transition temperature; then repeating said step (b) and said step (c);

step (e): repeating said step (d) till said limited length of time is long enough such that said hot spot can be detected by said method.

2 ~~6~~. The method as recited in claim ~~5~~ 1, wherein said heat generating means comprises a heating lamp.

3 ~~7~~. The method as recited in claim ~~6~~ 2, wherein said heating lamp has a coplanar filament.

4 ~~8~~. The method as recited in claim ~~5~~ 1, wherein said thickness adjustment process comprises:

cooling down said liquid crystal film to below said phase transition temperature;

adding said liquid crystal to said liquid crystal film if said liquid crystal film appears to be dark when viewed through said microscope, or removing part of said liquid crystal from said liquid crystal film if said liquid crystal film appears to be transparent and colorless when viewed through said microscope;

performing the process of said adding or said removing till said liquid crystal film exhibits a transparent and rainbow color when viewed through said microscope.

5 ~~9~~. The method as recited in claim ~~5~~ 1, wherein said current is an alternating current.

4 ~~10~~. The method as recited in claim 5 ~~9~~, wherein said alternating current comprises:

P1 a current with nominal frequency between 0.01 to 16 hertzs, a nominal duty cycle of 10 to 90%.

7 ~~11~~. The method as recited in claim 5 ~~8~~, wherein said differentiation means comprises:

P1 identifying said change that appears as a blinking spot;

observing the response of said blinking spot to the variation in said liquid crystal film's ambient temperature:

a25 cont'd

P1 said blinking spot is said hot spot if said blinking spot increases or decreases in blinking spot size as said liquid crystal film's ambient temperature increases or decreases respectively;

P1 said blinking spot is not said hot spot if said blinking spot does not change in blinking spot size as said liquid crystal film's ambient temperature increases or decreases.

8 ~~12~~. The method as recited in claim 7 ~~11~~, wherein said differentiation means further comprises:

P1 observing the frequency of said blinking spot, that is: said hot spot blinks at a frequency that is the same as the frequency of said alternating current; a non-hot spot which is a voltage induced blinking spot, blinks at faster than or equal to the frequency of said alternating current.

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~~13.~~ 9. The method as recited in claim ~~8~~ 1, wherein said liquid crystal comprises: a nematic liquid crystal; or a cholesteric liquid crystal; or a smectic liquid crystal.

~~14.~~ 10. The method as recited in claim ~~9~~ 1, wherein said liquid crystal is 4 CYANO-4' HEXYL-BIPHENYL, trade name is K-18 nematic liquid crystal.

~~15.~~ 11. A new use of liquid crystal for detecting hot spot on die or wafer with a hot spot detection method, said liquid crystal comprises:

4 CYANO-4' HEXYL-BIPHENYL, trade name is K-18 nematic liquid crystal; or

4 CYANO-4' PENTYL-BIPHENYL, trade name is K-15 nematic liquid crystal; or

4 CYANO-4' HEPTYL-BIPHENYL, trade name is K-21 nematic liquid crystal; or

4 CYANO-4' OCTYL-BIPHENYL, trade name is K-24 nematic liquid crystal; or

4 CYANO-4' NONYL-BIPHENYL, trade name is K-27 nematic liquid crystal; or

4 CYANO-4' DECYL-BIPHENYL, trade name is K-30 nematic liquid crystal; or

4 CYANO-4' UNDERDECYL-BIPHENYL, trade name is K-33 nematic liquid crystal; or

4 CYANO-4' DODECYL-BIPHENYL, trade name is K-36 nematic liquid crystal.

In response to your rejection of Claims 2 and 3:

In your letter you have rejected claims 2 and 3, under 35 U.S.C. 102 (e), as claims being anticipated by Burn's U.S. patent #4,242,635. After carefully studying Burn's patent, I have found the following:

Note that Burn's invention did not have any heating devices while my invention has a heating means to heat up the liquid crystal.

Note that Burn's invention uses only one light beam set; it is used solely for illuminating while my invention uses two light beam sets, one set for illuminating, another set for heating. The heating is the most important factor in my invention while Burn's invention is not concerned with heating.

Note that Burn's invention did not mention the liquid crystal phase transition temperature while my invention repeatedly mentions and utilizes the liquid crystal phase transition temperature.

Note that Burn's invention detects the changes in birefringent property within the liquid crystal phase while my invention detects the change from a liquid crystal phase to a liquid phase.

Note that Burn's invention has a transparent coverplate over the liquid crystal while my invention has no coverplate.

Note that Burn's invention only involves the detection of the voltage pattern on the integrated circuit while my invention involves the detection of heat dissipation on the integrated circuit and is not interested in detection of the voltage pattern.

Burn's patent only involves the detection of the phenomenon known in my patent as the "voltage induced blinkings," while my patent is only interested in detecting the phenomenon known in my application as the "hot spot induced blinking." Burn's patent did not touch on the subject of the "hot spot induced blinking."

The "voltage induced blinking" and the "hot spot induced blinking" are two very distinct phenomena:

a) The "voltage induced blinking" is induced by a change in the electric field in the liquid crystal which results in a change of both the birefringent property and the light scattering property in the liquid crystal. During this whole changing process, the liquid crystal remains in the liquid crystal phase.

b) The "hot spot induced blinking" is induced by the change in the temperature of the liquid crystal. During this process, the liquid crystal changes from the liquid crystal phase to the liquid phase.

In my application, I have invented a differentiation method to differentiate the "hot spot induced blinking" from the "voltage induced blinking." The differentiation process is the only area in which my patent brings up the subject of the "voltage induced blinking." Note that my invention is interested in differentiating and eliminating "voltage induced blinking" from "hot spot induced blinking rather than detecting the "voltage induced blinking.".

In view of all of the above reasons, I am pleased to state that my invention is not related to Burn's invention. Please consider these facts when reviewing my amended claims.

Please feel free to call me collect as I will be glad to discuss any questions you may have. I look forward to receiving your favorable decision.